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Summary of 1987 Coho Salmon Smolt Trapping Operations on the Lachmach River, British Columbia

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October 1990

Canadian Data Report of Fisheries and Aquatic Sciences No. 812

Canadian Data Report of Fisheries and Aquatic Sciences

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91-03645/

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Cat. No. Fs 97-13/0812E ISSN 0706-6465

Correct citation for this publication:

Finnegan, B. O., R. L. Dunbrack, and K. Simpson. 1990. Summary of 1987 coho salmon smolt trapping operations on the Lachmach River, British Columbia. Can. Data Rep. Fish. Aquat. Sci. 812: 27 p.

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ABSTRACT

Finnegan, B. O., R. L. Dunbrack, and K. Simpson. 1990. Summary of 1987 coho salmon smolt trapping operations on the Lachmach River, British Columbia. Can. Data Rep. Fish. Aquat. Sci. 812: 27 p.

A wooden fence trap was used to trap coho salmon smolts at the mouth of the Lachmach River, east of Prince Rupert, British Columbia, between April 1 and June 9, 1987. A total of 1909 smolts were trapped and 1790 smolts were subsequently coded wire tagged and released. Scales and morphological data were collected from a sample of 349 smolts. Of 237 sample fish that could be reliably aged, 184 were age 1 and 53 were age 2. It was not possible to get an accurate estimate of total smolt production because the fence was out of operation for a total of 14 days due to high water.

RÉSUMÉ

Finnegan, B. O., R. L. Dunbrack, and K. Simpson. 1990. Summary of 1987 coho salmon smolt trapping operations on the Lachmach River, British Columbia. Can. Data Rep. Fish. Aquat. Sci. 812: 27 p.

Entre le 1er avril et le 9 juin 1987, on a utilisé une barrière en bois pour capturer des tacons de coho à l'embouchure de la rivière Lachmach, à l'est de Prince Rupert (Colombie-Britannique). Des 1909 tacons pris, 1790 ont été munis de micromarques codées, puis ont été relâchés. On a prélevé des écailles et recueilli des données morphologiques sur 349 tacons. Des 237 poissons auxquels on pouvait attribuer un âge, 184 étaient âgés de 1 an, et 53 étaient âgés de 2 ans. Il a été impossible d'obtenir une évaluation précise de la production totale de tacons, à cause d'une crue des eaux qui a duré 14 jours.

INTRODUCTION

The Lachmach River Project is part of the Coho Salmon Research Program initiated in response to commitments made in the Canada-U.S. Pacific Salmon Treaty to obtain better information on the productivity of coho salmon (*Oncorhynchus kisutch*) stocks in British Columbia. The Lachmach River is located 23 km east of Prince Rupert, British Columbia, at the head of Work Channel (Fig. 1). It is situated in an area of high precipitation and the western slope of the watershed was clearcut logged between 1970 and 1981. A complete watershed description will appear in a future technical report. The data presented here are the results of coho smolt trapping and coded wire tagging activities conducted in the spring of 1987.

METHODS

A temporary "W" shaped smolt fence (Conlin and Tutty 1979) made with 1/4 inch mesh was installed in the early spring of 1987 at the mouth of the Lachmach River just below tidal influence. The fence was operational between April 1 and June 9.

Water temperature at the fence site was recorded with a submersible recording thermograph. All fish captured at the fence were counted daily. Before sampling and tagging, fish were anaesthetized (2-phenoxy ethanol), sorted into large and small size groups on the basis of fork length, and adipose fin clipped. The size sorting was intended to separate smolts into age classes 1+ and 2+. Prior to May 12 all fish less than 77 mm were considered to be age 1. After May 12 this was changed and all fish less than 85 mm were considered to be age 1. Fork lengths, horizontal eye diameters, weights, and scales for age determination, were collected from every tenth sample of large and small fish. Smolts were then nose tagged with standard coded wire tags (Northwest Marine Technology, tagging machine model Mark II). Tag codes were 8 24 33 for large smolts and 8 24 34 for small smolts.

Smolts trapped on May 6, May 8, June 3, and June 7 were released immediately after tagging. Smolts trapped on May 11 were tagged and then held for 23 days, during which time they were tested periodically for tag loss. These fish were kept in an 2.5 x 1 x 1 m holding pen and fed a subsistence ration of 1 mm Biodiet semi-moist pellets. Smolts captured on all other days were tagged, held for 24 hours and then checked for tag loss. All fish that had lost tags were retagged prior to release.

RESULTS

The Lachmach smolt fence was in use for 65 days. During this period there were frequent and rapid changes in river discharge resulting in 8 fence washouts. Although these washouts were repaired as soon as water conditions permitted, the fence was inoperable for a total of 14 days. It is therefore impossible to obtain an estimate of total smolt output from the system. However, of 13 jacks sighted during swim counts in the fall of 1987 only 1 had been adipose clipped. Since all jacks returning in the fall of 1987 would have smolted in the spring of 1987, this suggests that a large number of smolts left the system during fence washouts.

A total of 1909 smolts were captured at the fence and of these 1790 were tagged and released (Table 1; Fig. 2). Note that some smolts were captured on days when the fence was considered to be out, this means that the fence was partially fishing or that it was repaired for a short period of time. Scales and morphological data were collected from a sample of 349 smolts. Of 237 sample fish for which reliable ages could be obtained, 184 were age 1 and 53 were age 2 (Tables 2-5 and Fig. 3). Although an attempt was made to separate all smolts into these 2 age groups on the basis of fork length, this met with limited success because the size criteria used were inappropriate. The relationship between size and age from the sample data indicate that there were no misclassifications of age 2 fish with either criteria, but that misclassifications of age 1 fish would be expected at a rate of 72% for the 77 mm criterion and 58% for the 85 mm criterion. The use of the best length criterion identified from the sample data (95 mm) would have resulted in a misclassification rate of approximately 10% for both age groups, comparable to results obtained in other studies (Schubert and Federenko 1985). Subsequent work in the spring of 1988 and 1989 (Finnegan and Davies unpublished data) has shown that 65-70 percent of the outmigrant smolts from the Lachmach River are age 2, 25-30 percent are age 1 and 1-2 percent are age 3.

Tag losses within the first 24 hours following tagging averaged 14.8% over the entire smolt run, but were considerably higher early in the tagging period (Table 6). This high rate of tag loss was probably due to inexperience in the operation of the tagging machine. To estimate the number of fish that may have lost their tags after release it was assumed that there was negligible tag loss after 24 hours and that retagged fish were as likely to lose their tags as fish tagged for the first time.

The expected number of retagged fish which subsequently lost their tags was estimated as

$$\sum_{i=2}^{n} RT_i \cdot P_i$$

where i is the day of tagging, RT_i is the number of fish retagged on day i, and P_i is the proportion of tags lost by fish initially tagged on day i. The

resulting estimate for total tags lost from retagged fish was 69, leaving the expected number of tagged smolts at 1721. In the long term tag retention experiment (190 fish), there were 5 tags lost in the first 24 hours, 2 during the next 24 hours, and 1 during the next 21 days (Table 7); suggesting that the majority of tag loss occurred in the first 48 hours following tagging.

A total of 17 coho fry, 10 steelhead (*Oncorhynchus mykis*) adults, 5 steelhead smolts, 97 Cottus sp., and 13 Dolly Varden (*Salvelinus malma*) were also captured at the fence. Water temperatures taken at the fence site are given in Figure 4.

REFERENCES

Conlin, K. and B. D. Tutty. 1979. Juvenile salmonid field trapping manual. Fisheries and Marine Service MS Rep. 1530: 135 p.

Shubert, N. D. and A. Y. Federenko. 1985. Tagging and coded wire tagging of wild coho salmon juveniles in the upper Pitt River system, 1979 and 1980. Can. MS Rep. Fish. Aquat. Sci. 1815: 70 p.

Table 1. Summary of Lachmach smolt fence operations. Fence washouts are indicated by Fence Cond. 'out'. Fence dead are smolts killed when immobilized on the fence screen by high water pressure.

Date	Fence Cond.	No. Large Smolts	No. Large Smolts CWT[1]	No. Small Smolts	No. Small Smolts CWT[1]	Fence Dead
4/01/87	in					
4/02/87	in					
4/03/87	in					
4/04/87	in					
4/05/87	in					
4/06/87	in					
4/07/87	in					
4/08/87	in					
4/09/87	in					
4/10/87	out					
4/11/87	in					
4/12/87	in					
4/13/87	in					
4/14/87	out					
4/15/87	out					
4/16/87	out					
4/17/87	in					
4/18/87	in					
4/19/87	in					
4/20/87	out					
4/21/87	in					
4/22/87	in					
4/23/87	in	3				
4/24/87	in	5		3		
4/25/87	in	1		1		
4/26/87	out	1		0		
4/27/87	out	0		0		
4/28/87	in	0		0		
4/29/87	in	1		0		
4/30/87	out	9		0		
5/01/87	in	4		0		
5/02/87	in	0		1		
5/03/87	in	4		1		
5/04/87	in	13		2		
5/05/87	in	11		1		
5/06/87	in	7	31	1	4	
5/07/87	out	31	0	2	0	71
5/08/87	in	47	78	4	6	51
5/09/87	in	43	0	1	0	5
5/10/87	in	69	112	7	8	0
5/11/87	out	122	122	66	66	0
5/12/87	out	13	13	4	4	1
5/13/87	out	97	95	34	33	2
5/14/87	in	54	54	35	35	15
5/15/87	out	50	50	36	36	0
5/16/87	in	89	89	27	27	18

Table 1. (cont.)

Date	Fence Cond.	No. Large Smolts	No. Large Smolts CWT	No. Small Smolts	No. Small Smolts CWT	Fence Dead
5/17/87	in	127	127	57	57	28
5/18/87	in	84	84	29	29	
5/19/87	in	58	58	9	9	
5/20/87	in	36	36	25	25	
5/21/87	in	82	0	37	37	
5/22/87	in	127	127	51	51	
5/23/87	in	71	71	46	46	
5/24/87	in	33	33	16	16	
5/25/87	in	12	12	3	3	
5/26/87	in	22	22	12	12	
5/27/87	in	15	15	4	4	
5/28/87	in	11	11	6	6	
5/29/87	in	4	0	2	0	
5/30/87	in	4	8	2	4	
5/31/87	in	0	0	0	0	
6/01/87	in	0	0	0	0	
6/02/87	in	0	0	0	0	
6/03/87	in	14	14	6	6	
6/04/87	in	0	0	0	0	
6/05/87	in	0	0	0	0	
6/06/87	in	0	0	0	0	
6/07/87	in	3	3	1	1	
6/08/87	in	0	0	0	0	
6/09/87	in	0	0	0	0	
	TOTALS:	1377	1265	532	525	191

[1]CWT=Coded Wire Tagged. The number tagged sometimes exceeds the days catch because accumulated catches from previous days were also tagged that day.

Table 2. Age 1 smolt sampling data.

Date		Scale No.	Length (mm)	Weight (g)	Eye Diameter (mm)
23-Apr-87		3	79	4.55	5.35
Count=	1	Mean	79	4.55	5.35
		SD	0	0	0
24-Apr-87		5	77	4.1	6.1
		6	66	2.6	5.0
		12	81	5.15	5.9
Count=	3	Mean	74.7	3.95	5.67
		SD	6.34	1.05	0.48
25-Apr-87		13	69	3.45	5.6
Count=	1	Mean	69	3.45	5.6
		SD	0	0	0
26-Apr-87		15	83	5.6	5.5
Count=	1	Mean	83	5.6	5.5
		SD	0	0	0
30-Apr-87		18	96	7.3	6.85
		23	94	8.55	6.35
Count=	2	Mean	95	7.93	6.6
		SD	1	0.63	0.25
1-May-87		26	83	4.5	6
		27	80	5.05	5.6
		28	90	7.05	7
		29	88	5.7	6.15
Count=	4	Mean	85.3	5.58	6.19
		SD	3.96	0.95	0.51
2-May-87		30	77	4.4	5.5
		31	79	4.25	5.4
Count=	2	Mean	78	4.33	5.45
		SD	1	0.08	0.05
3-May-87		32	63	2.4	5.1
		35	90	6.8	6.1
		36	82	5.15	6.8
Count=	3	Mean	78.3	4.78	6
		SD	11.3	1.81	0.70

Table 2. (cont.)

Date	Scale No.	Length (mm)	Weight (g)	Eye Diameter (mm)
6-May-87	60	83	5.65	5.9
	61	77	4.4	6.3
	62	85	5.5	6.2
	71	94	7.2	7.1
	72	88	5.85	6.4
	73	76	3.85	6.5
	40	87	5.65	5.9
	54	100	8.6	7.1
	55	86	6.35	6.8
	59	72	3.85	5.4
	75	103	9.4	6.7
Count= 11	Mean	86.5	6.03	6.39
	SD	9.24	1.71	0.50
8-May-87	76	81	5.25	5.2
	79	80	5.1	5.6
	82	92	6.55	5.9
	84	90	6.45	6.7
Count= 4	Mean	85.8	5.84	5.85
	SD	5.31	0.67	0.55
9-May-87	86	78		6
	89	85		7.3
Count= 2	Mean	81.5		6.65
	SD	3.5		0.65
10-May-87	91	78	4.25	6.1
	92	85	5.7	6.5
Count= 2	Mean	81.5	4.98	6.3
	SD	3.5	0.73	0.2

Table 2. (cont.)

Date	Scale No.	Length (mm)	Weight (g)	Eye Diameter (mm)
11-May-87	104	84	5.45	6.5
	105	83	4.95	7
	106	90	6.1	7
	107	76	4.3	5.2
	108	82	5.25	5.8
	111	85	5.25	5.7
	115	75	3.9	5.5
	116	95	7.6	7.2
	119	81	4.9	7.5
	120	77	4.05	5.5
	121	90	6.55	7.2
Count= 11	Mean	83.5	5.3	6.37
	SD	6.02	1.06	0.80
12-May-87	123	107	11	6.1
	124	85	5.65	5.8
	130	89	6.1	6.8
Count= 3	Mean	93.7	7.58	6.23
	SD	9.57	2.42	0.42
13-May-87	132	85	3.75	5.3
	135	94	7.85	6.4
	139	74	3.55	5.7
	140	79	4.65	6.4
	141	78	4.75	5.8
	142	72	3.55	5.3
	143	80	4.8	6
Count= 7	Mean	80.3	4.7	5.84
	SD	6.82	1.39	0.42
14-May-87	147	89	6.05	6.7
	150	78	4.65	6.2
	151	94	7.5	7
	153	82	5.2	6
Count= 4	Mean	85.8	5.85	6.48
	SD	6.18	1.08	0.40

Table 2. (cont.)

Date	Scale No.	Length (mm)	Weight (g)	Eye Diameter (mm)
15-May-87	155	77	4.2	5.7
	156	94	7.5	7
	158	90	6.9	6.9
	159	90	6.55	6.4
	160	84	4.95	6.4
	161	79	4.25	5.5
	163	95	7.65	6.6
	164	77	4.3	6.5
Count= 8	Mean	85.8	5.79	6.38
	SD	7.00	1.42	0.49
16-May-87	165	94	7.6	7.7
	166	90	6.3	7.2
	168	83	4.7	6.7
	169	88	6.4	7.3
	173	92	7.25	7.55
	174	82	4.9	6.7
	176	62	2.9	6
	178	87	5.8	6.85
	181	78	4.35	6.4
	183	85	5.55	6.45
	184	82	5.45	6.55
Count= 11	Mean	83.9	5.62	6.85
	SD	8.28	1.32	0.50
17-May-87	185	93	7.55	6.9
	186	102	10.2	7.6
	187	78	4.1	5.95
	188	99	7.75	7.65
	189	86	5.9	6.75
	190	83	5.4	6.7
	193	85	5.55	6.5
	194	77	4.1	6
	195	90	6.6	6.3
	198	86	5.95	6.7
	199	85	5.7	6.35
Count= 11	Mean	87.6	6.25	6.67
	SD	7.49	1.67	0.53

Table 2. (cont.)

Date	Scale No.	Length (mm)	Weight (g)	Eye Diameter (mm)
	205	81	5.05	6.7
	206	84	5.4	6.5
	207	87	6	6.6
	208	84	5	6.3
	210	89	6.2	6.9
	212	76	3.8	5.4
	214	92	7.15	6.8
	215	73	3.95	6
	218	83	5.15	6.1
	219	89	6.2	6
Count= 11	Mean	84	5.41	6.36
	SD	5.41	0.94	0.43
19-May-87	222	100	3.4	6.7
	224	85	5.8	6.6
	225	86	5.9	6.5
	226	82	5.05	6.5
	227	98	7.85	7.2
Count= 5	Mean	90.2	6.6	6.7
	SD	7.33	1.29	0.26
20-May-87	230	79	4.4	5.5
	232	91	6.85	7
	233	73	3.5	5.5
	234	77	4.2	5.9
	235	70	3.1	5.9
	236	77	4.1	6.5
Count= 6	Mean	77.8	4.36	6.05
	SD	6.59	1.20	0.54
21-May-87	241	94	7.35	7.2
	243	92	7.45	7.1
	246	94	6.8	7.75
	247	92	6.8	7.45
	250	85	5.3	6.6
	252	78	4.5	5.5
	253	76	3.85	5.1
	254	67	3	5.1
Count= 8	Mean	84.8	5.63	6.48
	SD	9.44	1.6	1.01

Table 2. (cont.)

Date	Scale No.	Length (mm)	Weight (g)	Eye Diameter (mm)
22-May-87	257	87	5.75	6.4
	259	87	5.8	7.7
	261	91	6.65	6.8
	262	95	7.55	6.9
	264	96	7.35	7
	265	98	8.5	7.1
	269	84	5.2	6.7
	270	84	5.1	6.4
	271	85	6.3	7
Count= 9	Mean	89.7	6.47	6.89
	SD	5.16	1.08	0.37
23-May-87	272	85	5.6	6.5
	277	89	6.55	6.9
	278	87	6.45	5.5
	279	84	6.65	6.5
	280	62	2.35	4.8
	281	78	4.25	6.5
	282	85	5.1	6.1
Count= 7	Mean	81.4	5.28	6.11
	SD	8.53	1.45	0.67
24-May-87	284	54	5.4	6.2
	285	93	7.75	7.1
	286	79	4.65	5.9
	287	98	8.4	6.5
Count= 4	Mean	81	6.55	6.43
	SD	17.1	1.56	0.44
25-May-87	290	91	7	5.4
	291	98	8.15	6.55
	293	85	5.75	5.8
	294	86	5.7	6.4
Count= 4	Mean	90	6.65	6.04
	SD	5.15	1.01	0.46

Table 2. (cont.)

Date	Scale No.	Length (mm)	Weight (g)	Eye Diameter (mm)
26-May-87	295	83	5.1	5.7
	296	79	4.4	5.1
	297	85	5.85	5.8
	298	81	4.55	6.3
	299	86	5.95	6.8
	300	83	5.65	5.7
	301	87	5.9	6.45
	302	95	8.3	6.45
	303	89	6.2	6.2
	304	95	8	6.5
Count= 10	Mean	86.3	5.99	6.1
	SD	5.14	1.22	0.49
27-May-87	305	103	7.75	6.7
	309	87	6.55	6.8
	311	80	4.95	5.9
	312	81	5.1	7.3
Count= 4	Mean	87.8	6.09	6.68
	SD	9.20	1.15	0.50
28-May-87	317	108	10.7	7
	318	91	6.8	6.5
	319	103	9.55	6.1
	320	89	5.95	6.5
	321	86	5.7	5.4
	322	74	3.65	4.9
	324	73	3.95	5.3
Count= 7	Mean	89.1	6.61	5.96
	SD	12.3	2.46	0.71
30-May-87	326	79	4.45	5.9
	327	86	5.75	5.6
	328	82	5.1	6.4
	330	111	14.05	6.9
	332	93	6.85	6.6
	333	91	7.15	6.9
	334	95	7	6.8
	335	89	6.15	6
	336	96	9	6.5
Count= 9	Mean	91.3	7.28	6.4
	SD	8.81	2.70	0.44

Table 2. (cont.)

Date	Scale No.	Length (mm)	Weight (g)	Eye Diameter (mm)
3-Jun-87	338	81	4.4	5.6
	339	84	5.25	5.8
	340	83	5.65	6.5
	341	97	7.95	6.4
	342	86	5.3	5.9
	343	89	6	6.2
	344	87	6	6.2
	345	103	10.35	6.9
Count= 8	Mean	88.8	6.36	6.19
	SD	7.05	1.78	0.39
7-Jun-87	348	93	7.2	6.9
Count= 1	Mean	93	7.2	6.9
	SD	0	0	0
Total= 184	Mean	85.4	5.86	6.33
	SD	8.76	1.70	0.64

Table 3. Age 2 smolt sampling data.

Date		Scale No.	Length (mm)	Weight (g)	Eye Diameter (mm)
30-Apr-87		20	88	5.8	7.15
		21	114	13.45	8.3
		22	110	12	8.1
Count=	3	Mean	104	10.4	7.85
		SD	11.4	3.32	0.50
3-May-87		33	91	6.4	6.85
		34	96	7.5	7.5
Count=	2	Mean	93.5	6.95	7.18
		SD	2.5	0.55	0.33
6-May-87		43	115	13.4	7.8
		46	99	8.65	7.2
		47	97	8.2	7.8
		51	107	10.6	8.3
		56	106	10.35	7.2
		65	102	9.2	7.7
		68	110	11.55	8
Count=	7	Mean	105	10.3	7.71
		SD	5.84	1.67	0.37
8-May-87		78	105	10.3	7.9
		83	100	9.65	7.3
Count=	2	Mean	103	9.98	7.6
		SD	2.5	0.33	0.3
9-May-87		88	104		7.7
Count=	1	Mean	104		7.7
		SD	0		0
10-May-87		96	90	6.55	6.8
		99	101	8.5	7.5
Count=	2	Mean	95.5	7.53	7.15
		SD	5.5	0.98	0.35
11-May-87		102	100	8.35	7.2
		110	111	11.95	8.3
		117	103	9.3	7.6
Count=	3	Mean	105	9.87	7.7
		SD	4.64	1.52	0.45

Table 3. (cont.)

Date		Scale No.	Length (mm)	Weight (g)	Eye Diameter (mm)
12-May-87		127	99	8.9	7.2
		131	94	7	7.5
Count=	2	Mean	96.5	7.95	7.35
		SD	2.5	0.95	0.15
15-May-87		157	112	12.05	7.8
Count=	1	Mean	112	12.1	7.8
		SD	0	0	0
16-May-87		171	121	15.1	8.8
		180	108	11.35	7.9
Count=	2	Mean	115	13.2	8.35
		SD	6.5	1.88	0.45
18-May-87		200	109	11.8	7.3
		201	103	9.7	7.3
		213	93	7.4	6.95
		216	99	8.7	6.9
		217	110	11.5	7.2
Count=	5	Mean	103	9.82	7.13
		SD	6.34	1.67	0.17
19-May-87		223	107	10.35	7.5
		228	112	12.45	7.9
		229	109	11.85	7.7
Count=	3	Mean	109	11.6	7.7
		SD	2.05	0.88	0.16
20-May-87		231	116	13.9	7.6
		237	98	8.5	7.6
		238	99	8.75	7.6
Count=	3	Mean	104	10.4	7.6
		SD	8.26	2.49	0
21-May-87		240	109	11.4	7.55
Count=	1	Mean	109	11.4	7.55
		SD	0	0	0
22-May-87		255	125	16.6	7.9
		256	114	12.9	7.3
		260	103	9.15	7.8
		263	100	8.4	7.1
Count=	4	Mean	111	11.8	7.53
		SD	9.86	3.27	0.33

Table 3. (cont.)

Date		Scale No.	Length (mm)	Weight (g)	Eye Diameter (mm)
23-May-87		276	121	16.05	7
Count=	1	Mean	121	16.1	7
		SD	0	0	0
24-May-87		288	87	6.6	7.4
		289	118	74.65	8.1
Count=	2	Mean	103	40.6	7.75
		SD	15.5	34.0	0.35
27-May-87		306	95	7.65	7.1
		307	104	10.5	6.8
		310	109	9.75	6.1
		313	110	11.65	7.3
		314	108	11.85	7.3
Count=	5	Mean	105	10.3	6.92
		SD	5.49	1.52	0.45
28-May-87		315	113	12.8	7.5
		316	106	10.55	7.6
Count=	2	Mean	110	11.7	7.55
		SD	3.5	1.13	0.05
3-Jun-87		346	104	9.85	7.4
Count=	1	Mean	104	9.85	7.4
		SD	0	0	0
7-Jun-87		349	101	8.45	7.6
Count=	1	Mean	101	8.45	7.6
		SD	0	0	0
Total=	53	Mean	105	11.5	7.51
		SD	8.38	9.16	0.46

Table 4. Age 1 morphological sample data summarized by week.

Week	No. Smolts		Mean Length (mm)	Mean Weight (g)	Mean Eye Diameter (mm)
April 23 - April 29	6		75.8	4.24	5.58
		SD	6.23	1.10	0.36
April 30 - May 6	22		85.1	5.79	6.23
		SD	9.16	1.70	0.58
May 7 - May 13	33		84.0	5.50	6.21
		SD	7.27	1.51	0.65
May 14 - May 20	60		84.9	5.68	6.52
		SD	8.04	1.49	0.63
May 21 - May 27	44		87.0	6.24	6.34
		SD	9.51	1.55	0.63
May 28 - June 3	18		89.2	6.69	6.24
		SD	8.82	2.38	0.48
June 4 - June 9	1		93	7.2	6.9
		SD	0	0	0

Table 5. Age 2 morphological sample data summarized by week.

Week	No. Smolts		Mean Length (mm)	Mean Weight (g)	Mean Eye Diameter (mm)
April 30 - May 6	12		103	9.76	7.66
		SD	8.5	2.45	0.46
May 7 - May 13	10		101	8.94	7.50
		SD	5.5	1.55	0.39
May 14 - May 20	15		107	11.00	7.57
		SD	7.2	2.03	0.44
May 21 - May 27	14		108	15.70	7.31
		SD	9.8	16.60	0.48
May 28 - June 3	1		104	9.85	7.4
		SD	0	0	0
June 4 - June 9	1		101	8.45	7.6
		SD	0	0	0

Table 6. Retention of coded wire tags by smolts after 24 hours.

Date Tagged	Date Checked	Number Checked	Number Dead	No. With No Tag	Percent Tag Loss	Est. Retag Loss
5/06/87	5/06/87[1]	35				5
5/08/87	5/08/87[1]	84				12
5/10/87	6/10/87	109	0	18	16.5	0
5/12/87	5/13/87	17	0	0	0	0
5/13/87	5/14/87	125	0	6	4.8	2
5/14/87	5/15/87	89	0	23	25.8	7
5/15/87	5/16/87	85	0	25	29.4	2
5/16/87	5/17/87	155	0	12	7.7	3
5/17/87	5/18/87	170	13	40	23.5	13
5/18/87	5/19/87	111	2	35	31.5	9
5/19/87	5/20/87	67	0	18	26.9	7
5/20/87	5/21/87	54	0	21	38.9	2
5/21/87	5/22/87	117	0	10	8.5	1
5/22/87	5/23/87	178	0	20	11.2	1
5/23/87	5/24/87	117	0	5	4.2	1
5/24/87	5/25/87	47	2	9	19.1	1
5/25/87	5/26/87	14	0	2	14.2	0
5/26/87	5/27/87	34	0	2	5.8	0
5/27/87	5/28/87	19	0	1	5.2	0
5/28/87	5/30/87	17	0	0	0	0
5/30/87	6/03/87	12	0	1	8.3	0
6/03/87	6/03/87[1]	20				3
6/07/87	6/07/87[1]	4				0
	Totals	1680	17	248	14.8 (mean)	69

[1]Fish not held 24 hours.

Table 7. Losses of coded wire tags in long term tag retention group.

Date Tagged	Date Checked	Number Checked	Number Dead	No. With No Tag
5/11	5/11	190	0	5
5/11	5/13	17	1	7
5/11	5/14	189	0	7
5/11	5/16	188	2	7
5/11	5/20	184	0	6
5/11	5/23	187	4	6
5/11	5/26	178	0	7
5/11	6/03	177	0	8

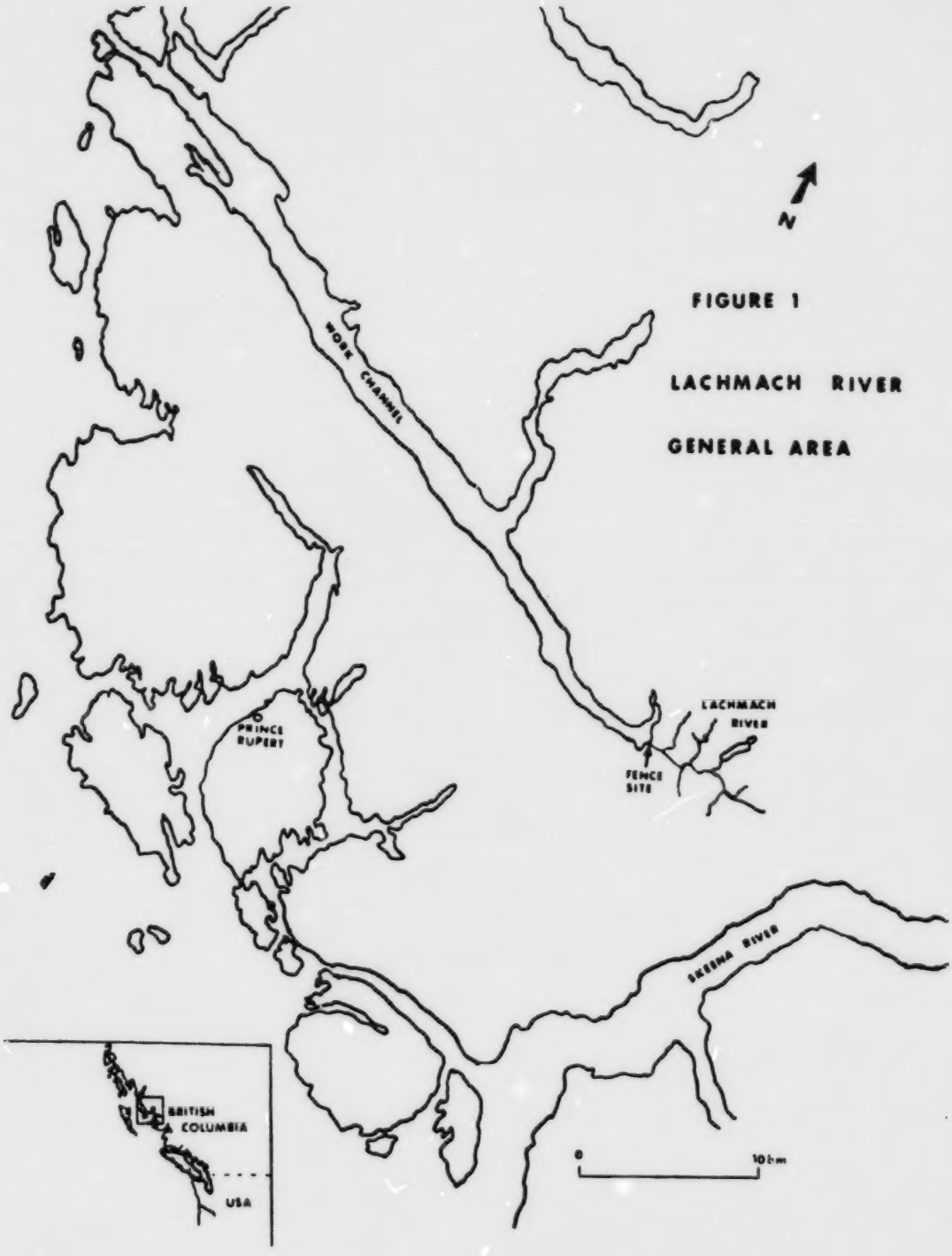

FIGURE 1

LACHMACH RIVER

GENERAL AREA

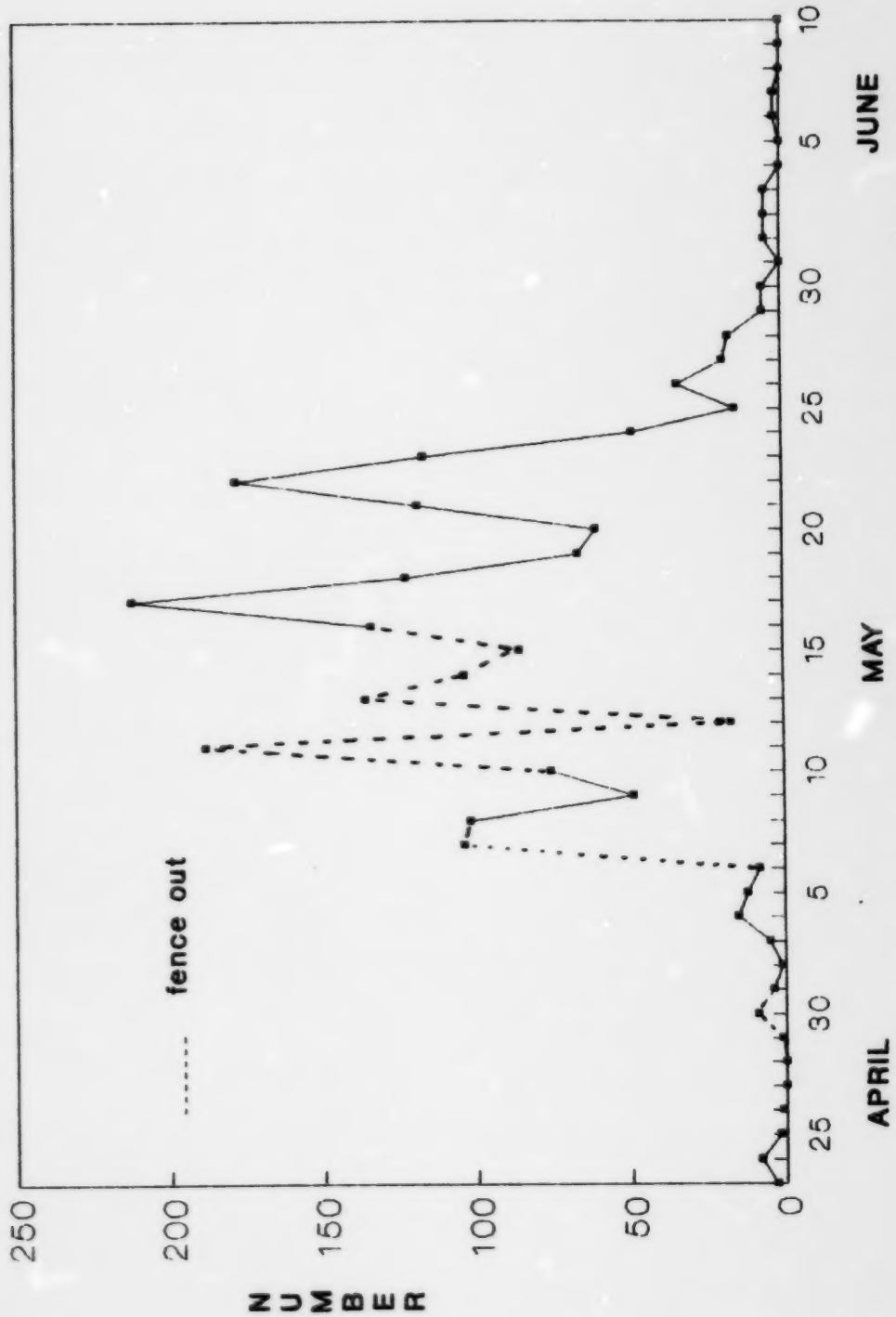

Figure 2. Daily captures of coho smolts in the Lachmach River, spring 1987.

Figure 3. Length frequency of coho smolts Lachmach River spring 1987.

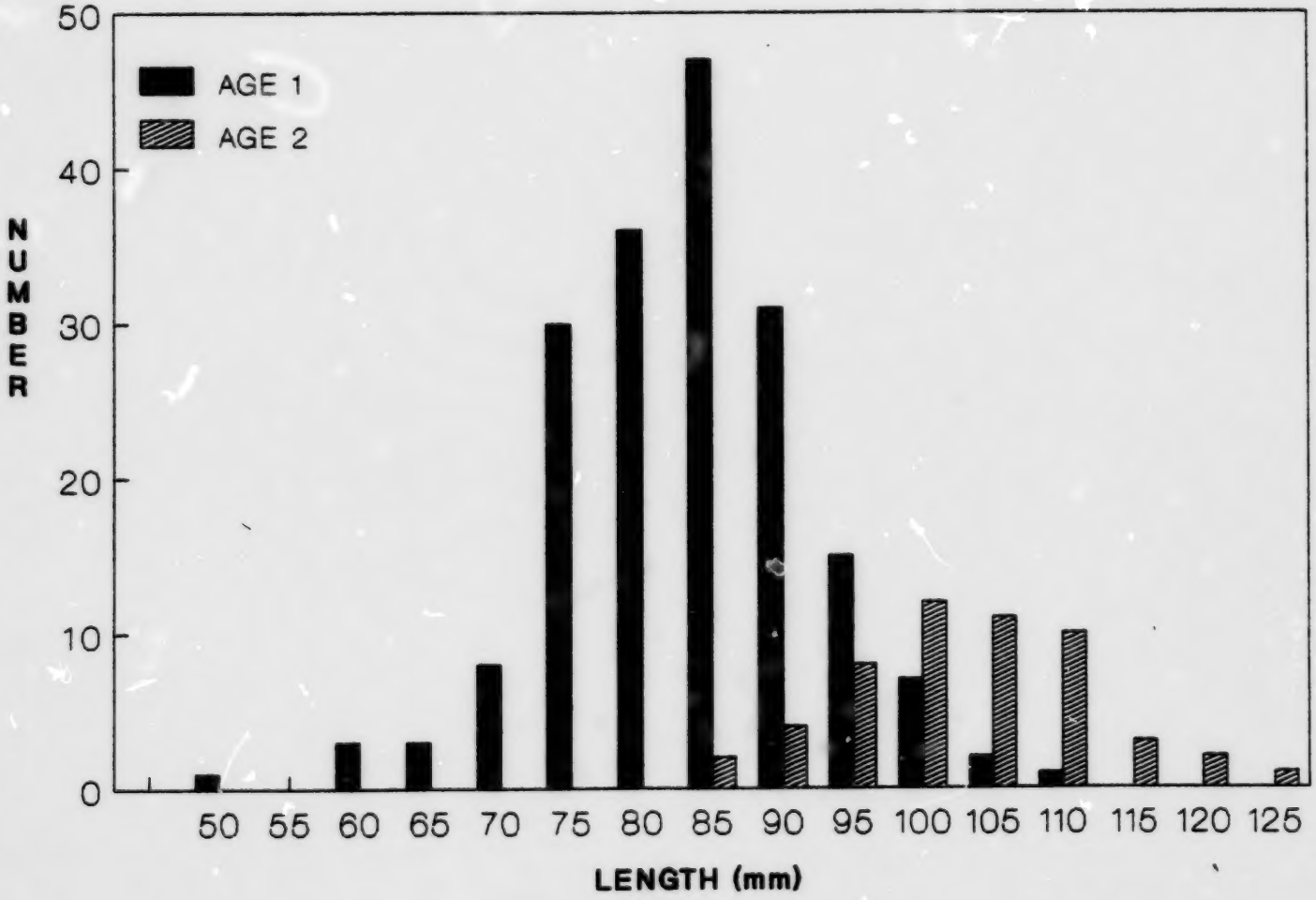

Figure 4. Mean daily water temperature Lachmach River spring 1987.